GrummanWorld

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Second Life. *Grummanites at Calverton, Long Island, work on the first of the remanufactured F-14A(PLUS) aircraft. Grumman will build 32 remanufactured Tomcats for the Navy. (Photo by Gerry Costello)*

Remanufacturing Program Finishing First F-14A(PLUS)

Aircraft Systems is finishing the first of 32 remanufactured F-14A(PLUS) Tomcats this month at Calverton Operations, Long Island. Navy pilots will fly the plane to Naval Air Station Oceana, in Virginia Beach, Virginia.

This Tomcat entered the fleet in 1982 as an F-14A. It returned to Grumman less than a year ago to be remanufactured. The goal is to have a nine-month turnaround time.

During remanufacture, the planes are torn down and put through a standard depot-level maintenance program to find and repair any broken, worn or corroded components.

Wings, fins and stabilizers are sent to Bethpage for rework. The old engines are removed and, in some cases, refurbished at the Naval Aviation Depot in Norfolk, Virginia, for use in fleet aircraft.

Grummanites in Bethpage build the kits needed to fit the new General Electric engines. These engines are slightly larger than the F-14A's Pratt and Whitneys.

Great River modifies some of the plane's avionics and builds adapter kits for the new electronic boxes that are installed in the A(PLUS). Several other Grumman sites, including Milledgeville and Stuart operations, also play a part in the remanufacturing process. Reassembly takes place at Calverton.

In addition to the new engines, both production and remanufactured F-14A(PLUS) Tomcats get six major new avionics systems, including a new radio, the Fatigue Engine Monitoring System and the ALR-67 radar.

Each month, Grumman will deliver three F-14A(PLUS) Tomcats to the Navy. In May, the Navy will get one remanufactured and two production planes. The two-to-one ratio of remanufactured and production aircraft will alternate each month thereafter.

By the end of the program, Grumman will have outfitted the Navy with 70 aircraft of this version. That will give the service four operational F-14A(PLUS) squadrons.■

Pentagon Proposes Buying A-6 Intruders

Pentagon also wants funding for A-6G development work, but Congress must approve

The Pentagon is now proposing to buy Grumman A-6 aircraft at least through 1991, but Congress now has to agree.

On April 28, Assistant Defense Secretary William Taft sent a letter to House Armed Services Committee Chairman Les Aspin (D-Wis.). In that letter, Taft proposed funding 10 more A-6s over two years and spending $215 million to develop an upgraded version of the Intruder to be known as the A-6G.

"However, these proposals still have to be approved by both the House and the Senate — four committees in all," says Pete Oram, Aircraft Systems Senior Vice President-Aircraft Programs. "The secretary's proposals are beneficial to Grumman for two reasons. One, it keeps our A-6 production line open. Two, it continues our A-6 development work."

Still, it must clear four hurdles in Congress. Taft also sent his proposal to the chairmen of the subcommittees on Defense, House and Senate Appropriations Committees, and the Senate Armed Services Committee.

The Reagan Administration did ask Congress to permit the Navy to spend $678.9 million on A-6s as part of the fiscal 1988 budget approved late last December. This money has still not been released pending a decision by Congress and DoD as to whether it should be used to upgrade A-6E's or to build new ones.

If Congress goes along with Taft's proposal, production of current A-6E's will continue through 1991. Right now, the company is authorized to build 19 more A-6E's, using funds approved in 1986 and 1987. Production of these planes will continue through the end of 1989.

In his letter to Aspin, Taft wrote, "As you know, we recognized some time ago the need to upgrade significantly our medium attack naval air capability. Over the past several years, we have spent hundreds of millions of dollars in developing that improved capability in an aircraft that was designated A-6F....

"In view of the sharp reductions in the resources available to the Department of Defense under the Budget Summit Agreements and in view of the concerns with program affordability expressed by Congress," continued Taft, "we have reevaluated our previous acquisition program for this upgrade...."

As a result, the Pentagon proposes $215 million to finance the development of a digital A-6 upgrade — the A-6G — that would be more combat survivable. "The eventual extent to which A-6 aircraft can be acquired or remanufactured will depend upon overall resources available, but we will continue to work with Congress to seek a mutually acceptable resolution to the funding issue," wrote Taft.

In addition, Taft proposed procuring 10 A-6E Systems/Weapons Improvement Program (SWIP) aircraft over a two-year period. This version of the Intruder is the same as the ones currently rolling off the Grumman production lines at Calverton on Long Island.

The proposed A-6G would have new radar, missile defense and communication systems and a digital cockpit — all similar to the original A-6F. However, the A-6F also incorporated new G.E. 404 engines; structural changes had to be made to the outside of the aircraft to accommodate these engines.

The "G" version would feature Pratt and Whitney 408A engines, the same engines that now power the EA-6B. These engines offer a higher thrust than the current P&W engines in the A-6E's. By using the P&W 408 engines in the "G" version, the older A-6E's can be modified into the "G" version easier than the "F" version.

The Navy had been expected to buy 200 A-6F's during the 1990s, and to retrofit 160 existing A-6s into the A-6F configuration. At this time, there are no projections on how many A-6G's or retrofits the Navy would want.■

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Grumman Reports First Quarter Results

Backlog remains at year-end record level

BETHPAGE, New York, May 4, 1988 — Grumman Corporation today reported 1988 first quarter net income of $21 million or 61 cents a share.

In the first quarter of 1987, income from operations was $22.9 million or 66 cents a share. Net income for the 1987 quarter was restated to $57.9 million or $1.73 a share because of a one-time gain of $35 million or $1.07 a share from a change in accounting for the company's income taxes.

Sales for the quarter increased 6.5 percent to $908 million from $852.2 million in the year-ago quarter. The company's backlog remained at its year-end record level of $7.9 billion.

Operating profits, before interest and taxes, were up $3.5 million to $50.3 million as sales increased and research and development expenses declined. Interest expense grew by $6.2 million to $18.5 million due to increased borrowings because of greater working capital requirements.

Sales were up in both the special purpose vehicles and information and other services segments. The delivery of 5,000 long life vehicles to the U.S. Postal Service added over $50 million to the vehicles segment which had total sales of $98.9 million. The company expects to deliver 18,000 of the trucks to the postal service this year, the first full year of production.

This will also be the first full year for NASA's space station program support contract, which was a major contributor to the $30 million increase in sales in the information and other services segment. Sales in this segment totaled $134 million.

In the aerospace segment, sales declined by $22.5 million to $650.3 million. Sales of the no-profit F-14D and A-6F development contracts were down over $50 million as those programs neared completion. Sales increased on the Navy's F-14, A-6, E-2C and C-2 aircraft programs.

"While our first quarter net income was down slightly, we expect our earnings for the entire year will be much improved from 1987," said John O'Brien, president and chief executive officer.

For the full year of 1987, the company reported net income of $35.7 million or 94 cents a share on sales of $3.4 billion. Net income was after an unusual charge of $26.4 million or 80 cents a share and an unusual gain of $35 million or $1.07 a share.

"The U.S. Air Force and Army Joint STARS development aircraft has completed its first two test flights," O'Brien reported. "As I said at our recent annual meeting, this program has been a technical challenge to Grumman, its suppliers and customers. That challenge is being met, as evidenced by the start of flight testing. It has, however, caused what we estimate to be a nine-month slip in the original program schedule. We are currently assessing the total effects of this delay.

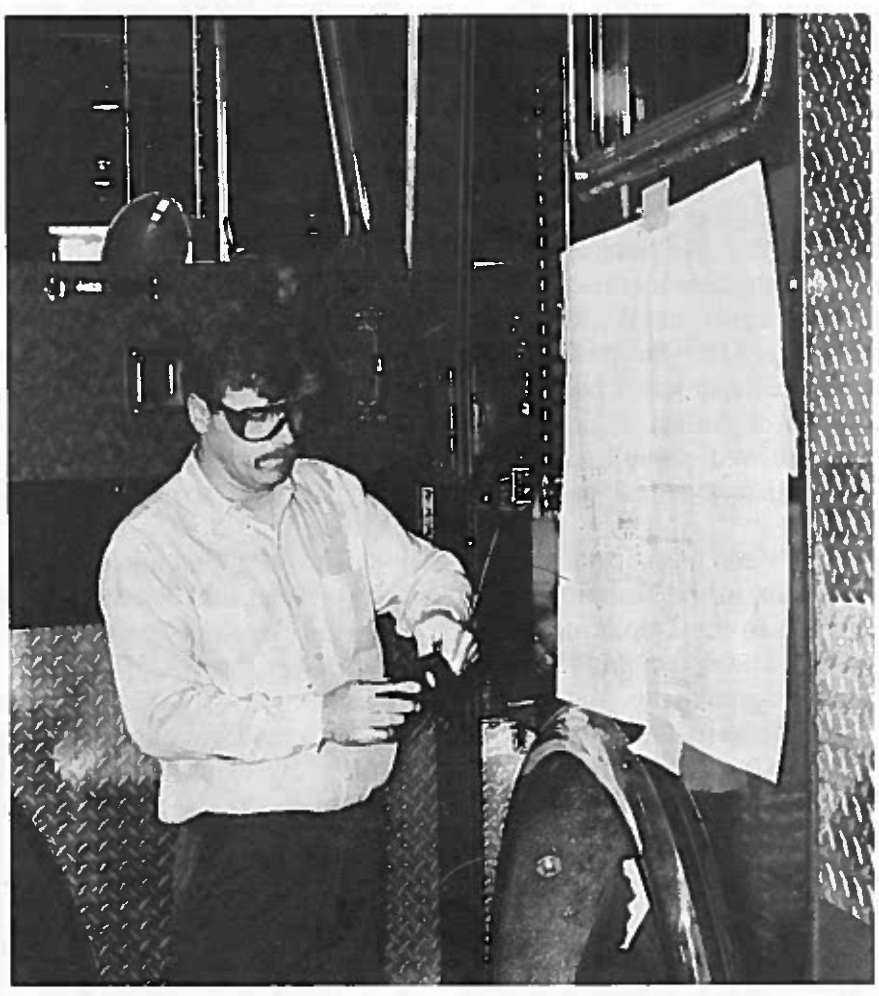
"Our Navy A-6 program is receiving growing support from both Congress and the Department of Defense for continued production beyond the currently funded 19 aircraft for delivery this year and next," O'Brien said. "But as we have said before, we are still unable to assess the results of continuing discussion between the Congress and the Navy over what version of the A-6 aircraft will be produced in 1990 and beyond."■

Grumman Corporation

Consolidated Financial Data
(Unaudited)
(Dollars in Thousands Except Per Share Amounts)

	Three Months Ended March 31, 1988	*Three Months Ended March 31, 1987**
Condensed Income Statement		
Sales	$ 908,021	$ 852,201
Income before Taxes	31,827	34,552
Provision for Federal Income Taxes	10,800	11,700
Income from Continuing Operations	21,027	22,852
Cumulative effect of change in accounting for income taxes	-	35,000
Net Income	$ 21,027	$ 57,852
Earnings Per Share:		
Primary:		
From Continuing Operations	$ .61	$ .66
Cumulative effect of accounting change	-	1.07
	$ .61	$1.73
Fully Diluted:		
From Continuing Operations	$ .60	$ .66
Cumulative effect of accounting change	-	1.02
	$ .60	$1.68
Balance Sheet Data At March 31		
Working Capital	$ 853,129	$ 736,646
Net Property, Plant and Equipment	596,141	533,430
Long-term Debt	649,241	493,811
Preferred Stock	42,587	44,962
Shareholders' Equity—Common	740,411	773,137
Shareholders' Equity per Common Share	$22.67	$23.67
Common Shares Outstanding	32,660,743	32,663,314
Backlog At March 31	$ 7.9 Billion	$ 7.2 Billion

** 1987 results have been restated for the effect of the change in accounting for income taxes in accordance with Financial Accounting Standard No. 96.*



Building A Lifesaver. *At Grumman Emergency Products, Roanoke, Virginia, Levi Graves works on a FireCat pumper. He is installing the electrical wiring for the truck's front side marker lights. Most Grumman pumpers are custom, one-of-a-kind trucks ordered by suburban, rural, and small-town fire departments.*

Award Winner

The Composites Institute of the Society of the Plastics Industry has awarded its Counterpoise Grand Design Award to Grumman. The award is for the Aerostructures Division's proof-of-concept design and fabrication of the engine thrust reversing translating cowl (transcowl) for the General Electric CF6-80CS engine. The transcowl's composite parts are built by Milledgeville Operations in Georgia, and assembled by Stuart Operations in Florida.■

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Almost Finished. *The new EA-6B building nears completion in Calverton, Long Island. The two story building will feature shielded rooms with laboratories on the first floor. The shielding is needed to keep powerful jamming signals from interfering with local transmissions. Offices and computers will be on the second floor. (Photo by Gerry Costello)*

Grumman Has Material Interest In Nova Scotia

HALIFAX, Nova Scotia — On April 29, the Canadian government announced the establishment of a $9 million organization that will do applied research in advanced materials, such as fiber-reinforced polymers, new metal alloys, ceramics and coatings.

Called the Advanced Materials Engineering Centre (AMEC), it is a nonprofit organization formed by Grumman, the Technical University of Nova Scotia (TUNS) and General Composite Technology Ltd., a Nova Scotia company specializing in advanced materials technology.

"AMEC will provide Grumman with opportunities to pursue cooperative technology research and to develop partnerships with Canadian defense and aerospace companies," said Grumman Vice Chairman-Development Dan Huebner at the ceremony.

The Province of Nova Scotia provided loan guarantees for AMEC, which Premier John Buchanan called "a world-class engineering center."

Two Canadian federal agencies provided start-up support for AMEC. "The field of advanced industrial materials holds the opportunity for considerable growth," said Stewart McInnes, Public Works minister and Halifax member of Parliament. "Yet, few private companies can afford the level of equipment and engineering talent required to break into the marketplace.

"By combining public and private resources with the expertise currently available within TUNS, we can create a first rate establishment for the application of new materials," McInnes said.

The plan is for the center to be self-sustaining by its fifth year of operation. By then, AMEC is expected to have more than 20 corporate members and to have generated more than $8 million in revenues. At that time the center will have a staff of 40 employees who will offer design and development services, conduct graduate and management seminars, and provide training programs.

Dr. Dick Scheuing, Grumman vice president and deputy director of Corporate Technology, and Charles Pieroth, director of Technology Development, Corporate Development, are on AMEC's board of directors.

Richard Hadcock, Grumman's deputy director of Technology Development, Technical Operations, is on loan to AMEC to serve as its president. "AMEC will be the bridge between research and commercial applications of the technologies," he said. "This will be done through the utilization of scientists, experienced engineers, technicians, state-of-the-art facilities and equipment, and training."

"The research work done at AMEC complements the work we do in our research labs," says Pieroth. "It does those things we'd like to do but cannot fund. And our scientists will have direct access to equipment that will be purchased for AMEC."

For the long term, it will help Grumman build ties to Canada's defense industry. It's a small industry: in total about the size of Grumman, says Pieroth. But it's growing, and it emphasizes international sales. "Canada exports about 80 percent of the military systems it produces," says Pieroth.

The Canadian emphasis on building a strong, home-grown defense industry has stifled Grumman's attempts to sell its finished products there. Pieroth says that Grumman has learned now that it should try to sell its technological skills to Canadian companies that need those skills to develop new products. According to Pieroth, Grumman is now holding discussions with Canadian companies for some specific projects.■

Houston Operations Now Part Of Aircraft Systems

HOUSTON, Texas — Grumman Houston Operations has become part of the Aircraft Systems Division. It had been a unit of the Electronics Systems Division.

Five hundred Grummanites work at Houston Operations. Before switching divisions, close to half Houston Operations' work already was on aircraft: it subcontracted its services to the Aircraft Systems Division. These Grummanites build A-6/EA-6B rudders, stabilizers, and fins; E-2/C-2 nacelles; EA-6B fin pods; and boarding ladders and doors.

The switch provides Aircraft Systems with people already trained in assembly-rivetting, mechanics, and other critical skills. In addition, over half of the Houston facility is high-ceilinged, which is unnecessary for most electronic work but vital to aircraft manufacturing.

The unit will continue to build large structures for Electronics Systems, such as test equipment vans. Production of small assemblies is gradually being phased out as orders are completed.

Obituaries

Aloysius G. Bouchey of Building Protection, Stuart, Aircraft Systems Division, died March 25 at the age of 61. He had been with the company since 1975 and resided at 32 Camino Del Rio, Port St. Lucie, Florida.

James N. Drake of GIV Inlets, Stuart, Aircraft Systems Division, died April 23 at the age of 26. He had been with the company since 1987 and resided at 4175 S.E. Broward St., Stuart, Florida.

Arthur M. Frank of Landing Gear Carrier, Bethpage, Aircraft Systems Division, died March 30 at the age of 58. He had been with the company since 1958 and resided at 12 Maplewood Dr., Plainview, N.Y.

Hugh C. Grandison Jr. of Component Test, Bethpage, Aircraft Systems Division, died April 8 at the age of 51. He had been with the company since 1956 and resided at 3718 Martha Blvd., Bethpage, N.Y.

William J. Keenan of GIV Aft Cowls, Stuart, Aircraft Systems Division, died March 31 at the age of 60. He had been with the company since 1987 and resided at 1926 S.W. Dorado La., Port St. Lucie, Florida.

George T. LeCron of Router and Shear, Bethpage, Aircraft Systems Division, died April 10 at the age of 60. He had been with the company since 1947 and resided at 3144 Chelsea La., Levittown, N.Y.

Alex Klimenko of Assembly Methods, Bethpage, Aircraft Systems Division, died March 21 at the age of 61. He had been with the company since 1966 and resided at 23 Karrie Ave., Bethpage, N.Y.

Personals

The family of the late Thomas Bianco acknowledges with grateful appreciation your kind expressions of sympathy. **Stephen Bianco**

My family and I sincerely thank all our friends, co-workers and ESO for their kind expressions of sympathy and support after the recent loss of my father. **Rocco Tropea**

I would like to thank my friends, co-workers and ESO for their kind expressions of sympathy following the loss of my mother. **Thomas Acheson**

My family and I, including my son Joseph of GDS, my uncle Nick Dicce and my brother-in-law Dave Haskell wish to express our gratitude to our friends, co-workers and ESO for their prayers, kindness and sympathy during the recent loss of my mother. **Luca Tribuzio**

I wish to thank all my friends, co-workers and ESO for their kind expressions of sympathy and thoughtfulness following the recent loss of my father Virgil Adkins. **Mary E. Moran**

My family and I would like to thank all our friends and the friends of my father Walter for their kind expressions of sympathy during our recent loss. **Rich Konig**

I would like to thank my friends, co-workers and ESO for their kind expressions of sympathy following the loss of my mother. **Chuck Draghi**

My family and I want to sincerely thank all of our friends and co-workers — especially in the Food Services, Traffic and Shipping departments — who helped us when we had a very bad fire. It helps to know that others care. My family will always remember all of you. **Grace and Dale VanValkenburg & Robert and Thomas Organ**

We would like to thank all of our friends, co-workers and ESO for their kind expressions of sympathy over the loss of our father Victor. **Nick and Sal Stracquadaini**

Meeting Of Minds. *In Calverton Methods, 'M' Team members are (L-R) Art Noveck, facilitator Charlie Baldwin, leader John Tartaro, Bob Aho, Steve Ciecwesz, and Steve Schaefer. Missing from photo: Dominick Chiaiese.*

Quality Circles Make Sense Out Of A Confusing Paperwork Problem

Imagine the obstacles you might face in convincing people you don't work with to try a new way of doing their jobs. Now try to convince their *managers* that you have a better idea.

That was the challenge facing "CenteRing" and "The 'M' Team," two quality circles in Aircraft Systems' Manufacturing department. The two circles represent the Bethpage and Calverton Methods Engineering departments.

They redesigned the engineering planning sheet, nicknamed the "P" sheet. They knew a change was desperately needed, and sold their own management on the idea. Without much hard or soft-sell, the circles also gained the enthusiasm of most of the company's engineering managers.

Methods translates the designs of Grumman engineers into instructions for people in the shop. The "P" sheet is a planning document that lists policies and procedures for aircraft parts affected by engineering changes. It cross-references the engineering drawings and supporting documents needed to make a part, and provides planned dates for when the engineering department will release the drawings.

From this, the methods engineers determine the tools and shop equipment that will be used and plan workflows. Schedules have to be precise, since parts from many different areas feed into subassembly groups. If the information on the "P" sheet is incorrect, manufacturing schedules will have errors — and labor, equipment time, and materials may go to waste.

"The engineering departments for Grumman's aircraft programs all churn out 'P' sheets," says Chuck Gosline, CenteRing's circle leader.

"Problem was, some groups had computerized their paperwork, others hadn't, and the ones that had computerized used different equipment and software."

Not only did the "P" sheets look different — the information ranged from too little to too much. The extra time required to verify or look up information made schedules difficult to produce.

"Furthermore, on programs such as the F-14, A-6 and the EA-6, there are a lot of engineering changes," says Kal Pogoloff, facilitator of CenteRing. "With lack of a standard format, and the number of 'P' sheets coming in all the time, we had to study each revision very carefully to make sure we had the correct information."

The two circles decided to revise the "P" sheet, incorporating a computerized format and a standard style requiring only 10 of the original 35 categories of facts. They also determined that it should be prepared on terminals linked to Engineering's IBM mainframe computers; this lets groups share data.

The project won the approval of a Senior Engineering Evaluation (SEE) committee working to improve systems linking engineering and manufacturing. The F-14D program was selected as a pilot project, to analyze the costs and benefits of the new "P" sheet. But all sides agree it should become a company standard.

"With the new 'P' sheet, we will save thousands of work-hours annually just on the F-14D program," says Gosline. Methods used to have to do a lot of research in preparing abstracts, periodic reports that give the status of engineering change programs. Now, all the information is accessible from the computer.

"In most cases, the revised 'P' sheet format can be accommodated and everybody I've dealt with so far has been very receptive," says Joe Popolo, manager—Quality in Engineering, Office of Corporate Technology, who oversees the SEE committees. "The project can be copied in many areas of the corporation."

The Quality Circles program was set up in 1983 to get Grummanites to share their ideas on improving the way they work. This is the first multidepartment project. Eight other projects have been put into effect by the CenteRing circle; the "M' Team has had four.

For more information about the new "P" sheets, contact Pogoloff at (516) 575-7069. For details about the Quality Circles program, contact Joyce Sparling at (516) 575-1819.■

Fine Tuning Fine Print. *Bethpage's CenteRing quality circle discusses the results of new 'P' sheets. They are (L-R) John Murray, Steve Hardy, David Orber, John Mahoney, facilitator Kal Pogoloff, leader Chuck Gosline, and Anthony Riemer. (Photos by Gerry Costello and Bob Settles)*

Retiree Obituaries

Wallace H. Ackerman of 10 Loma Place, Huntington, N.Y., died March 27, 1988. He retired in 1961.

Albert R. Balvin at P.O. Box 194, Rocky Point, N.Y. died April 18, 1988. He retired in 1967.

John J. Carberry of 1702 Frederick Ave., Merrick, N.Y., died April 4, 1988. He retired in 1986.

John J. Dittmaier of 32 Marilynn St., East Islip, N.Y., died Feb. 1, 1988. He retired in 1975.

John M. Duggan at RFD 1, Box 182, Stonington, Connecticut, died March 29, 1988. He retired in 1972.

Frank Gallo of 417 Forest Ave., Locust Valley, N.Y., died March 29, 1988. He retired in 1970.

Torquato Giordano of 407 S. 61st. Ave., Hollywood, Florida, died April 13, 1988. He retired in 1961.

James K. Higgins of 96 Cardinal Rd., Levittown, N.Y., died April 15, 1988. He retired in 1976.

James B. Joyce of 408 Ferndale Ct., Copiague, N.Y., died April 14, 1988. He retired in 1982.

Walter T. Konig of 192 Belmont Ave., West Babylon, N.Y., died March 24, 1988. He retired in 1986.

Ira Lacks of 6304 Winchester Ave., Ventnor, New Jersey, died April 2, 1988. He retired in 1968.

John Lombardi of 417D SW Natura, Deerfield Beach, Florida, died March 24, 1988. He retired in 1967.

Vincent F. Marconi of 47 N. Wantagh Ave., Levittown, N.Y., died April 18, 1988. He retired in 1987.

Victor H. Martin of 1078 Clyde Rd., Baldwin, N.Y., died April 14, 1988. He retired in 1972.

Thomas J. O'Meara of 8317 Stanwood St., New Carrollton, Maryland, died April 13, 1988. He retired in 1978.

Anthony D. Palaia of 10 First St., Glen Cove, N.Y., died April 19, 1988. He retired in 1971.

Frank J. Pasciuto of 56 Roosevelt Blvd., Beverly Hills, Florida, died March 25, 1988. He retired in 1975.

Hendrik W. Rietmeyer of RFD West Side Rd., North Conway, New Hampshire, died April 8, 1988. He retired in 1972.

Harold R. Schwenk of 240 Columbus Pkwy, Mineola, N.Y., died March 27, 1988. He retired in 1984.

James D. Talley of 1200 W. Old Liberty Rd., Sykesville, Maryland, died March 29, 1988. He retired in 1988.

SCORECARD Makes Cost Tracking A New Ball Game

With lots of help from retired Grumman systems designer Gerry Barber, three Grummanites in Resource Control built a computer system.

The system's name is SCORECARD — Special Computer Operated Report Enhancement for Cost And Resource Data — thanks to some thesaurus combing by senior computer analyst Jack Christensen, who was its principal architect. His acronym tells the story of a system that has saved Grumman about $300,000.

This unit of Corporate Development keeps tabs on all the Research and Development budgets. At the end of every month, even while much of Grumman is collecting turkeys and packing up for the year-end holiday, the 10 Grummanites in this group must account for customers' and Grumman dollars spent on over 200 research and development projects under way in the various Grumman divisions.

The Latest Stats. *In headquarters, Grumman Vice Chairman-Development Dan Huebner uses the SCORECARD to study research and development expenditures.*

Before Grumman created divisions in 1985, research and development projects were primarily planned and controlled the old fashioned way: with paper and pencil and calculator.

"As divisionalization approached," recalls Bob Aberle, the manager of the Resource Control Group, "it became obvious that we would need extra people to monitor accounts in each of the divisions and to create all the necessary summary reports."

There was enough new work for three more people. But there was no room in the budget for them. In order to meet their responsibilities, Resource Control decided to try to automate.

Gerry Barber did the programming with Resource Control's Christensen. They were later joined on the project by senior planning engineers Al Lipp and Natalie Wells-Vargas. The SCORECARD program they came up with made use of the information available in Data System's big computers in headquarters.

The first SCORECARD let them pull out the monthly divisional account figures as well as weekly payroll numbers. Moreover, they could do it without the need for posting, which is the hand transcription of information from one computer run to another. With SCORECARD, Resource Control was able to print some extensive monthly reports with a minimum of manual labor.

Unfortunately, the original system wasn't designed to do all the fancy spreadsheet magic most personal computers easily do. More than that, Resource Control wanted a management information system that their boss, Vice Chairman—Development Dan Huebner, could also tap with his PC.

Looking At A Winner. *In Building 5 in Bethpage, senior planning engineers Natalie Wells-Vargas and Al Lipp are developing new graphics for their home-grown SCORECARD system. (photos by Bob Settles)*

What Barber, Christensen, Lipp and Wells-Vargas did was come up with a way to get the SCORECARD data into their personal computers and store it. Then, Barber wrote programs that could manipulate the data on the PCs. Since all the PCs in Resource Control's Building 5 offices were networked, each PC could get to the information. Better yet, all the instructions and menus were in everyday language, taking the question of training out of the loop.

Then they connected a couple of modems to get the information through ordinary phone lines over to headquarters and into Huebner's PC. After the modems were installed, Huebner tried SCORECARD on his PC.

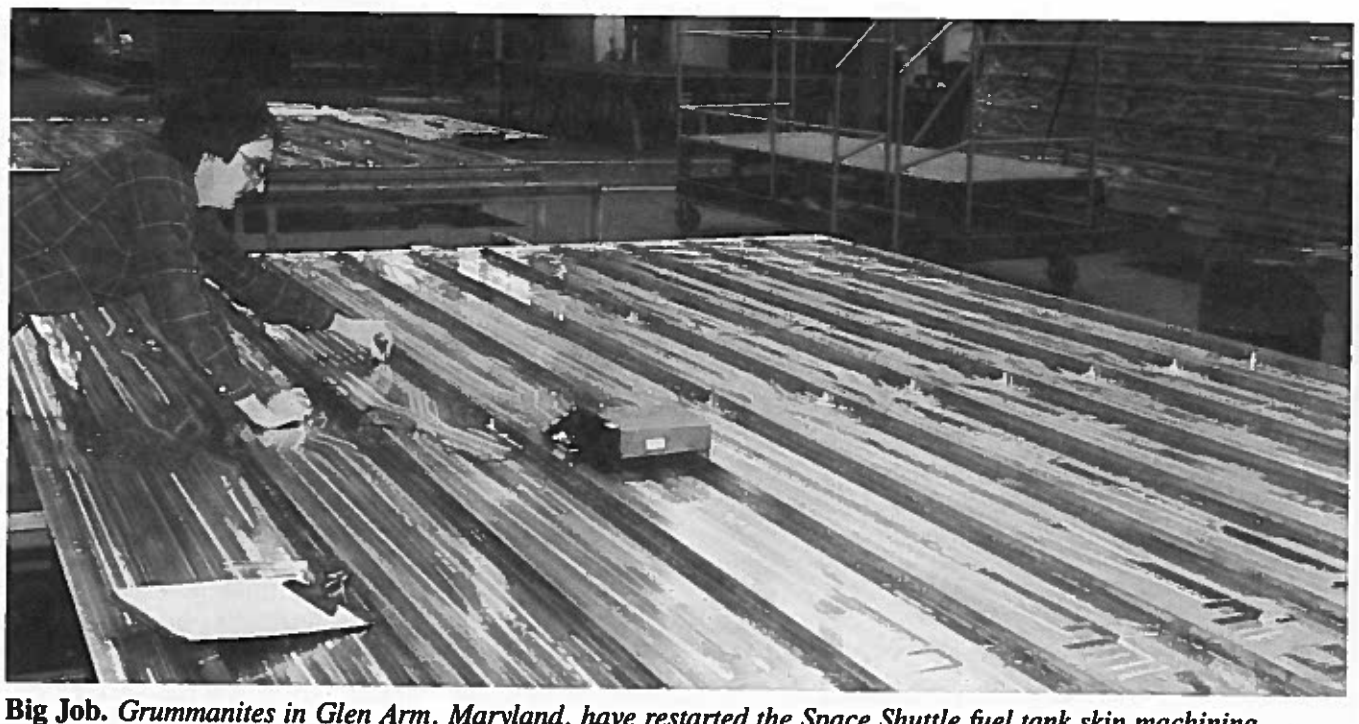
"He sat right down and operated it like he designed it himself," Aberle says.

Although the entire SCORECARD system took several years to develop, the PC adaptation took just a few months.

Aberle says the system is easily adaptable to any Grumman group that has to follow budgets. "I'd like to see other people in Grumman take what we have and use it, and maybe improve on it."

It's been a year now since they got the PC-based system working, and it hasn't let them down. Instead of monthly reports, they are now producing some sophisticated weeklies and still they are trying to make it better.

"We are developing this system every day," says Wells-Vargas, who is now working on some new menus and color graphic capabilities for SCORECARD. While "turkey day" still might not be much fun around Resource Control, at least the colors on the computer screens will make the season more festive.■



Big Job. *Grummanites in Glen Arm, Maryland, have restarted the Space Shuttle fuel tank skin machining program. Here, Mark Bachman checks dimensions on one of the 16 skins in the first ship set. With skins up to 11x20 feet, it took lots of hours to make the hundreds of checks on each skin. However, the first ship set is now ready to be delivered to Martin Marietta.*

Lecture Has New Guest Speaker

A new speaker has been chosen for the next Leroy Grumman lecture.

Neal Saunders, director of Aeronautics at NASA's Lewis Research Center, will speak at the lecture on Thursday, May 26 in the Grumman Headquarters auditorium. Saunders replaces Melvin Hartmann, who withdrew due to other obligations.

Saunders will speak on the future of aeropropulsion. The program begins at 4:30 p.m.

All Grummanites are invited, but space is limited. To reserve a seat, call Mary Mickol at (516) 575-8770.■

People

Bernie and Susan Riemer

Foreign Exchange

For Grummanite Bernie Riemer, spending a year in Japan researching fusion energy was the chance of a lifetime.

Riemer worked for the Japan Atomic Energy Research Institute (JAERI) as part of a technological exchange program between the U.S. and Japan. He normally works at the Oak Ridge National Laboratory in Tennessee, where Grumman has a contract for energy research.

Initially, Bernie hesitated to make the move. It meant his wife, Susan, had to quit her job at a Knoxville mortgage company. "But we decided the opportunity was too good to pass up," he says.

Bernie was assigned to JAERI's Naka Fusion Research Establishment, 150 miles north of Tokyo. Turning down subsidized housing for foreigners, the Riemers rented a house two towns away — owned by an engineer who had just been transferred to Oak Ridge.

"We lived in a real Japanese neighborhood, with a rice farm across the street," says Bernie. "Although only a few people spoke English well, we made a lot of new friends. It was much more of an education for us than living in an apartment complex among other Westerners."

At Naka, Bernie worked on Japan's Fusion Experimental Reactor (FER). Fusion aims to release energy by uniting the nuclei of atoms, rather than splitting them as in nuclear fission. Japan has already built a large experimental reactor similar to the Tokamak Fusion Test Reactor at Princeton University; the FER is now on the drawing boards.

Bernie was assigned to the magnet engineering group, doing stress analysis of the FER's toroidal coils. These coils surround the doughnut-shaped vessel in which fusion takes place.

"Stress analysis is very important," says Bernie. "You can't have anything break during the life of the machine. Otherwise, it might be down two years to be fixed."

Bernie didn't spend all his time at the Institute; the assignment gave him a glimpse of what goes on inside some of the largest Japanese companies. "Industry there is investing much more heavily than the U.S. is in fusion research," he says.

Technologically, the Japanese are on par with the Americans in fusion science. But there is a big difference in the degree of commitment between the two societies.

"Japan's energy situation is much different from America's," Bernie says. "The Japanese import all of their oil, and they are strongly behind long-term energy research. They want to find solutions to this dependency on foreign sources. They are funding other types of fusion reactors as well as other energy technologies."

While Bernie was at work, Susan taught English. When the couple first got to Japan, she was stopped by a woman in the local grocery store who wanted to take lessons. Not long thereafter, Susan was working four days a week, conducting private lessons as well as classes — including a roomful of Japanese engineers.

Bernie Riemer says Americans should be as eager to learn Japanese.

"A high school grad in Japan has over six years in English; a college graduate, 10 years," says Riemer. "Yet few American high schools even offer Japanese as an elective. How can we expect to sell American goods and services to them if we don't make the effort to learn the language?"

Would he take a similar assignment again?

"Perhaps someday, but not right away," says Riemer. "Susan and I are expecting our first baby right now...made in Japan. We'll be sending back a lot of pictures to all our Japanese friends."

This New House

ROANOKE, Va. — Everybody likes to find ways to save on housing. Connie Sheppard of Grumman Emergency Products took the matter into his own hands: he built his own log house.

Sheppard's two-story farmhouse was crafted from pine trees he cut down on his 30-acre spread.

"I wanted to have a log cabin since I was a kid," says Sheppard. "I put in a foundation and went from there."

The project took three years. He had a very clear idea of what he wanted: he made no blueprints.

"The hardest part was cutting the logs," he recalls. "That took a year because they had to be skinned right after cutting. I used to hurry home in the spring to skin as many as I could before dark.

"Laying them in place took the next year. Those logs are heavy. Depending on whether I worked overtime, I may have been able to put down two logs in an evening before it got too dark."

In addition to the timber, Sheppard gathered stones from his property to build the fireplace that goes up the center of the house. The floors are poplar, floor and roof joists are pine, and the roof is tin. He used factory-built windows.

In his kitchen, Sheppard built cabinets of rough-cut lumber, which his wife stained and finished. Along the way, Sheppard got help from family and friends. He would throw a party or barbeque as an incentive.

The house's seven gables weren't inspired by the Hawthorne classic: Sheppard's wife wanted more headroom on the second story. Doing so also divided up the floor space. Otherwise, there are no doors or partitions, save for the two bathrooms.

The only "modern convenience" the house lacks is central heating. "But between the fireplace and a wood-burning stove, it stays very warm through the winter," Sheppard says. "It's in the woods, so evergreens keep the wind off the house. They also shade it in the summer."

Pioneering Design. *Grummanite Connie Sheppard's seven-gabled log house is made from trees he cut down on his Virginia farm.*

He's A Star

Grumman's Alan Lager received the Electronic Industries Association's 1988 Engineering Department Distinguished Contribution Award.

Lager works in Melville, Long Island, in Aircraft Systems' Configuration Data Management department. He received the award for his leadership and contributions to government and industry data and configuration management, in Washington, D.C., on April 18 during the group's spring conference.

Ohioan Volunteer

Eric Ladd, a project coordinator with Grumman Ohio Corporation, was one of the 10 winners of the Community Service Award from the *Columbus Dispatch* newspaper. He was nominated for the award by co-worker Kathy Riblet because, she says, "I believed what he does makes a difference."

As a volunteer in a program called Man-to-Man, Ladd helps smooth the return to society for inmates soon up for parole. He also works with the Worthington Community Band, Hope Hotline, a 24-hour service for Franklin County residents who have drug or alcohol problems, and Tele-Friend, for which Ladd makes nightly calls to elderly people to make sure they are okay.

Ladd joined Man-to-Man eight years ago, shortly after coming to Grumman. Once matched with an inmate, he explains, "I start about six to nine months before parole date. I'll try to find him a residence in a halfway house or with a relative and get him a job."

Unfortunately, Ladd eventually loses touch with those he's helped. "They are very appreciative of what we do," he says, "but the program is part of their past and they want to put their past behind them."

Medical Targets Blood Cholesterol Control

What's your blood cholesterol level?

At the recent Health Fair in Bethpage, over 1,000 Grummanites found out how much of the fatty substance was floating in their blood.

Turns out, most of those tested were recorded as having borderline blood cholesterol levels.

One Grummanite was shocked to find her level at 223 mg. "I can't believe it," she said. "I took the test out of curiosity. I think I better start cutting down on the butter."

According to the National Institute of Health, levels below 200 mg are classified as desirable, those from 200 to 239 mg are borderline high, and those 240 mg and above are considered high.

Done by an outside lab, the test required a finger prick for blood and a 10 minute wait.

Results were kept confidential. However, the Grumman Medical Department was on hand to offer additional information and counselling to those interested in learning how to keep their cholesterol levels under control. Anyone with a level of 200 mg or above was advised to see a doctor.

"After getting their test results, a lot of people stopped by to chat about what to do next," says Elisabeth Keep, Grumman's corporate nutritionist. "Although most of them don't seem to be in bad shape now, I suggested it was time for them to start watching their diets."

The body needs cholesterol to survive. Bile, important in digestion, is manufactured from cholesterol. But the body makes enough cholesterol on its own. The liver manufactures it from fat.

It's only when people eat foods high in cholesterol that it becomes dangerous to the body.

The American Heart Association reports that diet is the most powerful and safest way to lower blood cholesterol levels. They recommend the "healthy-heart" diet.

In this diet, total fat intake is reduced to 30 percent of one's total calories. No more than 250 to 300 mg of cholesterol are consumed daily. That's about the amount in one large egg yolk.

The diet requires leaner meat, fish, and fowl as protein sources. It suggests using skim milk rather than whole and switching from butter to margarine. Eggs are limited to two a week, red meat to two or three meals a week, and cheese servings to only three or four a week.

Results from the "healthy-heart" diet are measurable within a month.

Keep works with Grumman's Food Services to provide plenty of low-cholesterol meal options in the cafeteria. "We spend a couple of days a week trying out new recipes using less fat and salt," says Keep. "The homemade soups have a lot less salt than they used to.

"There's always plenty of fresh vegetables, fruits and poultry available," says Keep. "But there are people who still grab a hamburger, french fries, and a container of whole milk. It's frustrating, but the cafeteria has to offer something for everyone."

It is possible, however, that not everyone is fully aware of cholesterol's harmful effects.

As cholesterol travels through the body, it lines the walls of the arteries with deposits called plaque. The name for this condition is atherosclerosis.

This buildup of plaque increases over time and causes the arteries to become hard -- losing their ability to expand and contract -- and narrow. This blocks the flow of blood to vital organs such as the heart and brain. A heart attack or stroke could occur if a clot or bit of plaque blocked the artery.

"But, cholesterol can be good as well as bad," says Ada Colter, Health Fair Coordinator. "It's a matter of what protein carries it in the blood."

Cholesterol is transported in the blood as part of molecules called lipoproteins. HDL (high-density lipoprotein) carries cholesterol from the walls of blood vessels, where it can create problems, back to the liver. That's why it's called 'good cholesterol.'

LDL (low-density lipoprotein) carries cholesterol from the liver to the walls of blood vessels. Therefore, it is known as the 'bad cholesterol.'

"It's the combination of the HDL and LDL levels that make up a person's total cholesterol count," says Colter. "The HDL level should always be higher than the LDL level."

No smoking and a good exercise program can also help to raise HDL and lower LDL levels.

According to a pamphlet published by the National Heart, Lung and Blood Institute, dietary therapy should be continued at least six months before deciding whether to add drug treatment of high cholesterol.

The institute also recommends that all adults age 20 and over have their cholesterol measured at least once every five years.

The Grumman Medical Department is considering cholesterol screenings several times a year in addition to eye tests, blood pressure checks, and glaucometer tests for blood sugar.

"Judging by the amount of people who turned out to have their cholesterol levels checked, I'd say they are concerned," says Colter. "The Medical Department always tries to respond to the needs of Grummanites."■

Battling Fat and Cholesterol

Eating foods low in fats and cholesterol can reduce your risk of heart attack. The American Heart Association recommends that you limit your daily intake of cholesterol to less than 300 milligrams.

Be Careful	Grams Fat	Milligrams Cholesterol	...And Enjoy	Grams Fat	Milligrams Cholesterol
Brownie (1 average)	9.4	25	Sherbert (1 cup)	4.0	7
Carrot cake (3½ oz.)	20.4	30	Whole-wheat bread (1 slice)	0.8	0
Ice cream (1 cup 16% fat)	23.8	84	Frozen yogurt (1 cup)	3.0	10
Ricotta cheese (½ cup)	16.1	63	Cottage cheese (½ cup 1% fat)	1.6	5
Yogurt (1 cup whole milk)	7.7	30	Yogurt (1 cup low-fat)	3.4	14
Whole egg	5.5	250	Egg white	*	0
Butter (1 tablespoon)	12.2	36	Margarine (1 tablespoon)	12.0	0
Ground beef (3 oz. 27% fat)	16.9	86	Flatfish (3½ oz.)	0.8	61
Chicken Liver (1 cup)	4.4	746	Chicken (3 oz. white meat)	4.2	66
Mayonnaise (1 tablespoon)	11.0	5	Miracle Whip (1 tablespoon)	7.0	5

*Trace Source: USDA

Newsweek: February 8, 1988

Next Issue: May 27

Readership Survey

We don't want to do all the talking. We'd like to know what you think about the things you see in these pages. Your comments, suggestions and complaints are welcomed. Please take a few minutes and give us your opinions.

Article	Great	Good	Poor	Didn't Read
Canadian Center (P. 3)	☐	☐	☐	☐
Quality Circle (P. 4)	☐	☐	☐	☐
Scorecard (P. 5)	☐	☐	☐	☐
People (P. 6)	☐	☐	☐	☐
Cholesterol Testing (P. 7)	☐	☐	☐	☐
Chairman's Letter (Back Cover)	☐	☐	☐	☐

Suggestions For Future Articles:.....

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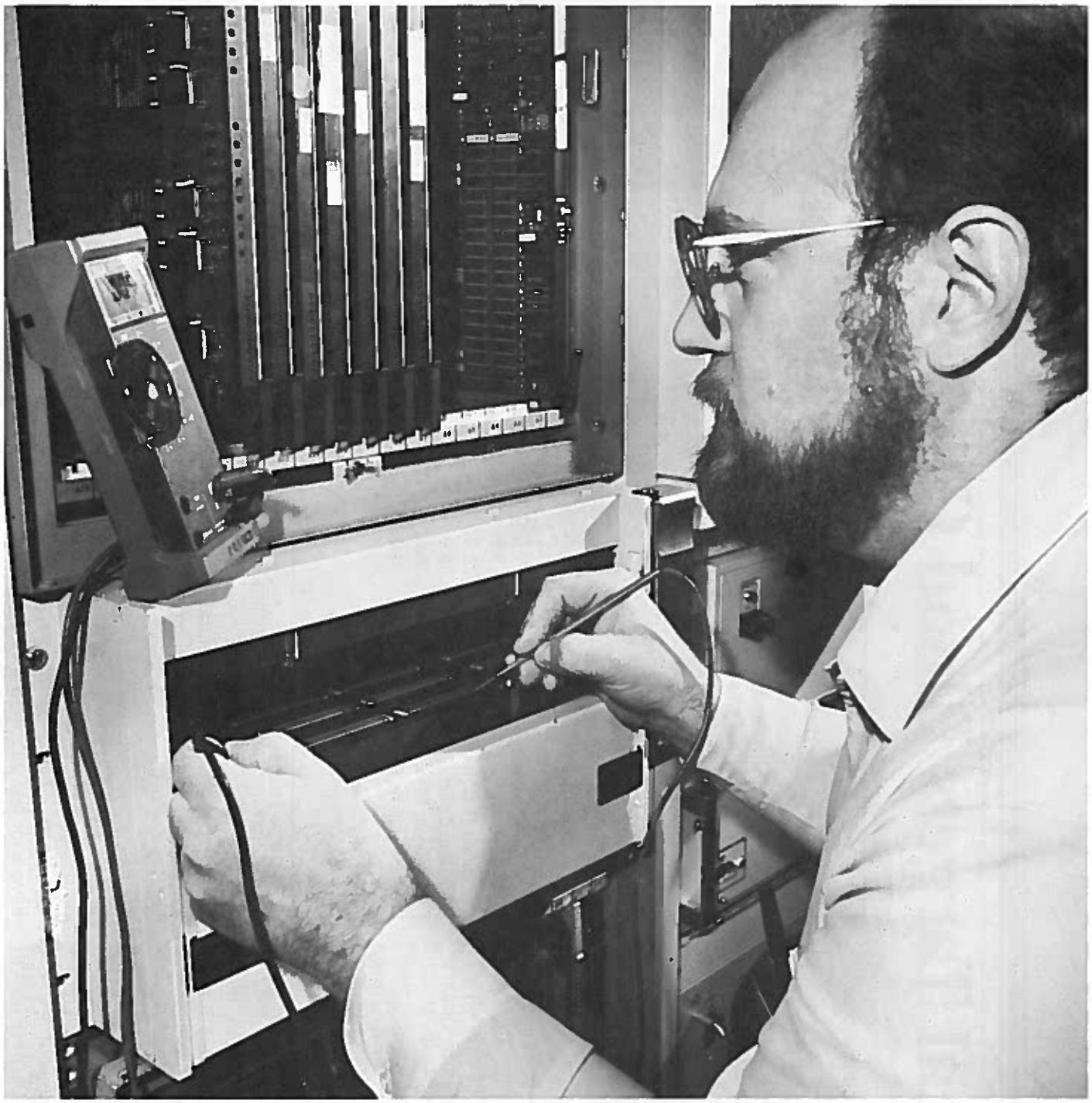
May 13, 1988

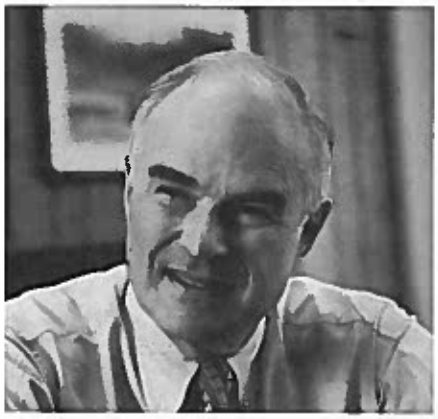


(Photo by Bob Settles)

Across The Boards

In Building 106 in Melville, Long Island, electronics technician Tony Wevers checks a chassis circuit board for Commercial Equivalent Equipment, a unit of the Army's Intermediate Forward Test Equipment. Commercial Equivalent Equipment is used to develop test program sets — software that enables portable field test devices to troubleshoot particular weapon systems.

A Letter From The Chairman



Two and a half years ago, in November 1985, this column was about the Electronics Systems Division, which was then only a few months old. It said, "...we have the facilities, the product lines, and the management structure to permit the division to grow. It will develop its own character, seek its own opportunities. And it's going to be exciting to watch it take off."

Well, the Electronics Systems Division has taken off, and it's flying fast and high.

We report our financial results in four business segments. Although the electronics segment includes both the Electronics Systems and Melbourne Systems divisions, it's easy to see that this has been an area of tremendous growth for us. In 1985, sales for the electronics segment were $220 million; for 1987, they were $637 million. Because Joint STARS is still in development, it hasn't turned a profit yet. Accordingly, virtually all of last year's $8.4 million in profits is from the Electronics Systems Division — about eight times the profit the segment showed in 1985.

Today, Intermediate Forward Test Equipment (IFTE) is the division's premier product, and we expect it to produce more than $1.5 billion in revenues. The Army wants all its electronic equipment through the year 2005 to be compatible with IFTE. Grumman is constantly looking for — and finding — new uses for it. The system has enormous potential.

Electronics Systems continues to support its sister divisions well. It has tried to create an awareness of its capabilities among these divisions, so that when they need a component or part, they will look to Electronics Systems first to supply it.

The Electronics Systems Division is establishing Grumman as a major supplier of high technology electronics in the military marketplace. It has found a niche in products it builds for Grumman programs, in automatic test equipment, in display and trainer and industrial products.

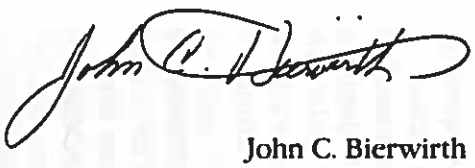
However, I think the most interesting thing about this division is that it is bringing us into entirely new businesses. It is developing a command of emerging technologies in microwave products, very-high-speed digital communications networks, gallium arsenide devices, and guided weapons systems

For instance, RPVs, or remotely piloted vehicles. These are unmanned aircraft that can provide over-the-horizon radar capability. Electronics Systems is working on a series of sensor designs to address this need. The Tachonics unit is making excellent progress in designing and building integrated circuits on gallium arsenide. Gallium arsenide is much more resistant to heat and radiation, and offers better frequency performance than silicon. It is especially well suited for use in high-speed computers.

Robotics is another important area. Later this year, we'll deliver to the Army for testing a prototype of TMAP — Teleoperated Mobile Antiarmor Platform. TMAP is a four-wheeled vehicle that can carry many payloads; an infantryman will operate it fiber-optically from miles away. It isn't difficult to imagine many uses for such a robot.

Last month, there was an article in the *New York Times* about the shrinking gap between science and technology. It said that through most of history, the two operated independently; from the time of a scientific discovery, centuries would pass before there would be a practical application of that discovery. In more recent times, the span has gotten smaller. Generating electricity took 51 years from science to application; the atomic bomb took 40 years; genetic engineering took 20 years, and semiconductor diodes only six. Today, however, the delay between science and technology may be no more than a few years or even a matter of months.

In our company we can see the rush to technology in many areas: it is certainly evident in the Electronics Systems Division. Its product line will change quickly: established products will be upgraded, new ones will be added. We must make sure that it hangs on to its biggest advantage: an appetite for innovation.



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